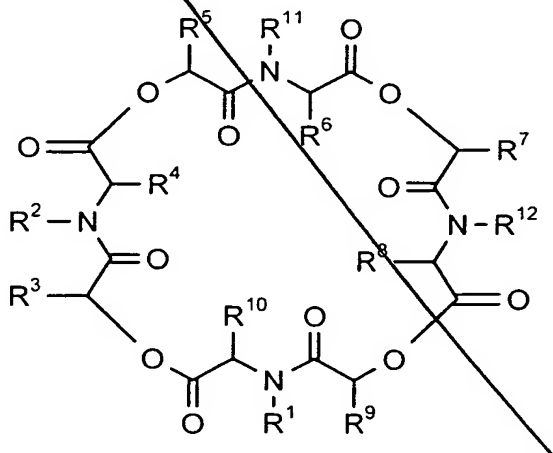
Patent claims

1. The use of piperazines for increasing the endoparasiticidal action of cyclic depsipeptides consisting of amino acids and hydroxycarboxylic acids as ring units and having 24 ring atoms.

2. An endoparasiticidal composition which contains piperazines together with cyclic depsipeptides consisting of amino acids and hydroxycarboxylic acids as ring units and having 24 ring atoms.

3. The use of piperazines together with cyclic depsipeptides consisting of amino acids and hydroxycarboxylic acids as ring units and having 24 ring atoms for the production of endoparasiticidal compositions.

4. The use of piperazines as claimed in claim 1, characterized in that the cyclic depsipeptides correspond to the formula (I)



(I)

in which

R^1, R^2, R^{11} and R^{12} independently of one another represent C_{1-8}-alkyl, C_{1-8}-halogenoalkyl, C_{3-6}-cycloalkyl, aralkyl, aryl,

R^3, R^5, R^7, R^9 independently of one another represents hydrogen or straight-chain or branched C_{1-8}-alkyl, which can optionally be substituted by

hydroxyl, C_{1-4}-alkoxy, carboxyl, $(-\overset{\overset{O}{\|}}{C}OH)$, carboxamide, $(-O-\overset{\overset{O}{\|}}{C}-NH_2)$, imidazolyl, indolyl,

guanidino, -SH or C_{1-4}-alkylthio and further represents aryl or aralkyl which can be substituted by halogen, hydroxyl, C_{1-4}-alkyl, C_{1-4}-alkoxy,

R^4, R^6, R^8, R^{10} independently of one another represent hydrogen, straight-chain C_{1-5}-alkyl, C_{2-6}-alkenyl, C_{3-7}-cycloalkyl, each of which can optionally be substituted by hydroxyl, C_{1-4}-alkoxy, carboxyl, carboxamide, imidazolyl, indolyl, guanidino, SH or C_{1-4}-alkylthio, and represent aryl or aralkyl which can be substituted by halogen, hydroxyl, C_{1-4}-alkyl, C_{1-4}-alkoxy,

and their optical isomers and racemates.

5. The use as claimed in claim 4, characterized in that the cyclic depsipeptides correspond to the formula (I), in which

R^1, R^2, R^{11} and R^{12} independently of one another represent methyl, ethyl, propyl, isopropyl, n-, s-, t-butyl or phenyl, which is optionally substituted by halogen, C_{1-4}-alkyl, OH, C_{1-4}-alkoxy, and also represent benzyl or phenethyl, each of which can optionally be substituted by the radicals indicated in the case of phenyl, and

R^3 to R^{10} have the meaning indicated in claim 4.

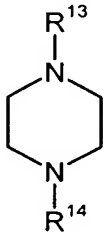
6. The use as claimed in claim 4, characterized in that the cyclic depsipeptides correspond to the formula (I), in which

R^1, R^2, R^{11} and R^{12} independently of one another represent methyl, ethyl, propyl, isopropyl or n-, s-, t-butyl,

R^3, R^5, R^7, R^9 represent hydrogen, straight-chain or branched C_{1-8}-alkyl, in particular methyl, ethyl, propyl, i-propyl, n-, s-, t-butyl, each of which can optionally be substituted by C_{1-4}-alkoxy, in particular methoxy, ethoxy, imidazolyl, indolyl or C_{1-4}-alkylthio, in particular methylthio, ethylthio, and further respresent phenyl, benzyl or phenethyl, each of which can optionally be substituted by halogen, in particular chlorine, and

R^4, R^6, R^8, R^{10} independently of one another represent hydrogen, methyl, ethyl, n-propyl, n-butyl, vinyl, cyclohexyl, each of which can optionally be substituted by methoxy, ethoxy, imidazolyl, indolyl, methylthio, ethylthio, and represent isopropyl, s-butyl and further represent optionally halogen-substituted phenyl, benzyl or phenylethyl.

7. The use as claimed in claims 1 or 4 to 6, characterized in that the piperazines correspond to the formula (X),



(X)

in which

R^{13} and R^{14} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted alkyl, cycloalkyl, aryl, heteroaryl, and $-CONR^{15}R^{16}$ or $-CSNR^{15}R^{16}$, in which

R^{15} and R^{16} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted alkyl or cycloalkyl.

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8. The use as claimed in claims 1 or 4 to 6, characterized in that the piperazines correspond to the formula (X), in which

R^{13} and R^{14} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl, and $-CONR^{15}R^{16}$ or $-CSNR^{15}R^{16}$, in which

R^{15} and R^{16} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted C_1-C_6-alkyl or C_3-C_8-cycloalkyl.

9. The use as claimed in claims 1 or 4 to 6, characterized in that the piperazines correspond to the formula (X), in which

R^{13} and R^{14} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted C_1-C_4-alkyl, C_6-cycloalkyl, and $-CONR^{15}R^{16}$ or $-CSNR^{15}R^{16}$, in which

R^{15} and R^{16} independently of one another represent identical or different substituents of the group hydrogen, in each case optionally substituted C_1-C_4-alkyl or C_6-cycloalkyl.

10. The composition as claimed in claim 2, characterized in that the cyclic depsipeptides correspond to one of the definitions mentioned in claims 4 to 6 and/or the piperazines correspond to one of the definitions mentioned in claims 7 to 9.

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